DOCUMENT RESUME

ED 179 769 CE 023 478

AUTHOR	Adamsky, Richard A.; Cotrell, Calvin J.
TITLE	Vocational Teacher Education: A Review of the Research. Information Series No. 185.
INSTITUTION	ERIC Clearinghouse on Adult, Career, and Vocational Education, Columbus, Ohio.
SPONS AGENCY	National Inst. of Education (DHEW), Washington, D.C.; Ohio State Univ., Columbus. National Center for Research in Vocational Education.
PUB DATE	79
CONTRACT	400-76-0122
NOTE	44p.
AVAILABLE FROM	National Center Publications, National Center for Research in Vocational Education, The Ohio State University, 1960 Kenny Road, Columbus, Ohio 43210 ($2.80)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Financial Support; Job Skills; *Performance Based Teacher Education; Personnel Needs; Research Projects; State Aid; Systems Development; Task Analysis; *Teacher Recruitment; *Teaching Experience; *Training Techniques; *Vocational Education Teachers
IDENTIFIERS	Information Analysis Products; *Vocational Teacher Education

ABSTRACT

Research literature was reviewed for the joint purposes of assessing the state of the art in vocational teacher education research and attempting to determine whether vocational teacher education has escaped its ancillary status and, through significant research, moved toward becoming an intellectual field. Most of the research studies deal with teachers' occupational competencies and experience and use the task-analytical approach. The standardization of occupational competency tests is now the focus of several research efforts. One area which has attracted little research is the problems of teacher recruitment. An area where more research is recommended is that of personnel and materials resources and the disparity from state to state in availability of these resources, especially money for funding. Another area, one in which much significant research has been done, is that of performance-based teacher education, which continues to grow and spread throughout many states. Other research has dealt with alternative techniques for dispensing system content and the ways to organize this content. It was concluded that, at present, vocational teacher education remains an ancillary activity, due partly to lack of financial support and sparseness of research in the field. (CT)

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ED179769

Information Series No. 185

VOCATIONAL TEACHER EDUCATION: A REVIEW OF THE RESEARCH

written by

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and

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in collaboration with the
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of
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1979

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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FUNDING INFORMATION

Project Title:	ERIC Clearinghouse on Adult, Career, and Vocational Education
Contract Number:	NIE-C-400-76-0122
Educational Act Under Which the Funds were Administered:	Vocational Educational Amendments of 1976, P. L. 94-482
Source of Contract:	Department of Health, Education, and Welfare National Institute of Education Washington, D.C.
Contractor:	The National Center for Research in Vocational Education The Ohio State University Columbus, Ohio
Project Director:	Marla Peterson
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FOREWORD

The Educational Resources Information Center on Adult, Career, and Vocational Education (ERIC/CE) is one of sixteen clearinghouses in a nationwide information system that is funded by the National Institute of Education. One of the functions of the Clearinghouse is to interpret the literature that is entered in the ERIC data base. This paper should be of particular interest to teacher educators, school administrators, curriculum development specialists, researchers and graduate students.

The profession is indebted to Richard Adamsky and Calvin Cotrell for their scholarship in the preparation of this paper. Special appreciation also is extended to the National Association of Industrial and Technical Teacher Educators (NAITTE) Research Committee, chaired by Dr. Curtis Finch of Virginia Polytechnic Institute and State University, for co-sponsoring this document. Recognition also is due Olive Church, the University of Wyoming; Glenn Baker, Texas A and M University; and Dewey Adams, The National Center for Research in Vocational Education, for their critical review of the manuscript prior to its final revision and publication. Robert D. Bhaerman, Assistant Director for Career Education at the ERIC Clearinghouse on Adult, Career, and Vocational Education, coordinated the publication's development. Cathy Thompson assisted in the editing of the manuscript and Bonna Somerlott typed the final draft.

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ABSTRACT

Research literature was reviewed for the joint purposes of assessing the state of the art in vocational teacher education research and attempting to determine whether vocational teacher education has escaped its ancillary status and, through significant research, moved toward becoming an intellectual field. Most of the research studies deal with teachers' occupational competencies and experience and use the task-analytical approach. The standardization of occupational competency tests is now the focus of several research efforts. One area which has attracted little research is the problem of teacher recruitment. An area where more research is recommended is that of personnel and materials resources and the disparity from state to state in availability of these resources, especially money for funding. Another area, one in which much significant research has been done, is that of performance-based teacher education, which continues to grow and spread throughout many states. Other research has dealt with alternative techniques for dispensing system content and the ways to organize this content. It was concluded that, at present, vocational teacher education remains an ancillary activity, due partly to lack of financial support and sparseness of research in the field. (CT)

DESC::Job Skills; *Performance Based Teacher Education; Personnel Needs; Financial Support; Research Projects; State Aid; Systems Development; Task Analysis; *Teacher Recruitment; *Teacher Experience; *Training Techniques; *Vocational Education Teachers

IDEN::*Vocational Teacher Education; Information Analysis

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INTRODUCTION

Vocational teacher education has been provided for through federal support since 1907. Unfortunately, for the most part, the area has been considered an ancillary activity rather than a developing intellectual field (Swanson, 1974). For this reason, research on vocational teacher education has been sparse. Much of the research has resulted from the efforts of graduate students with limited resources and with little previous research experience. The findings of such studies often were not generalizable and had to be cautiously applied.

The situation brightened somewhat in 1965 when federal funds became available for vocational research and development activities. However, the effect was not particularly felt in vocational teacher education. Moss (1967), after reviewing the research on vocational teacher education between 1962 and 1967, concluded that with few exceptions little had been done to develop a science of teacher education. In his opinion vocational teacher education was operating on the basis of tradition, conventional wisdom, and personal experience. The period between 1967 and 1973 was no more fruitful. Peterson (1973) also found few studies to review on vocational teacher education.

Have the years since 1973 been more fruitful? Has vocational teacher education escaped its ancillary status and, through research, moved toward becoming an intellectual field? The recent research on vocational teacher education must be carefully examined in order to explore these questions.

In an attempt to identify all potentially relevant research in vocational teacher education, a search was performed using the ERIC files and Dissertation Abstracts. The research period was from 1972 to the present. In addition, in order to broaden the data base, letters were sent to over fifty vocational teacher educators. These were people involved in graduate level vocational teacher education programs. As a result, over 600 potentially relevant documents were initially identified.

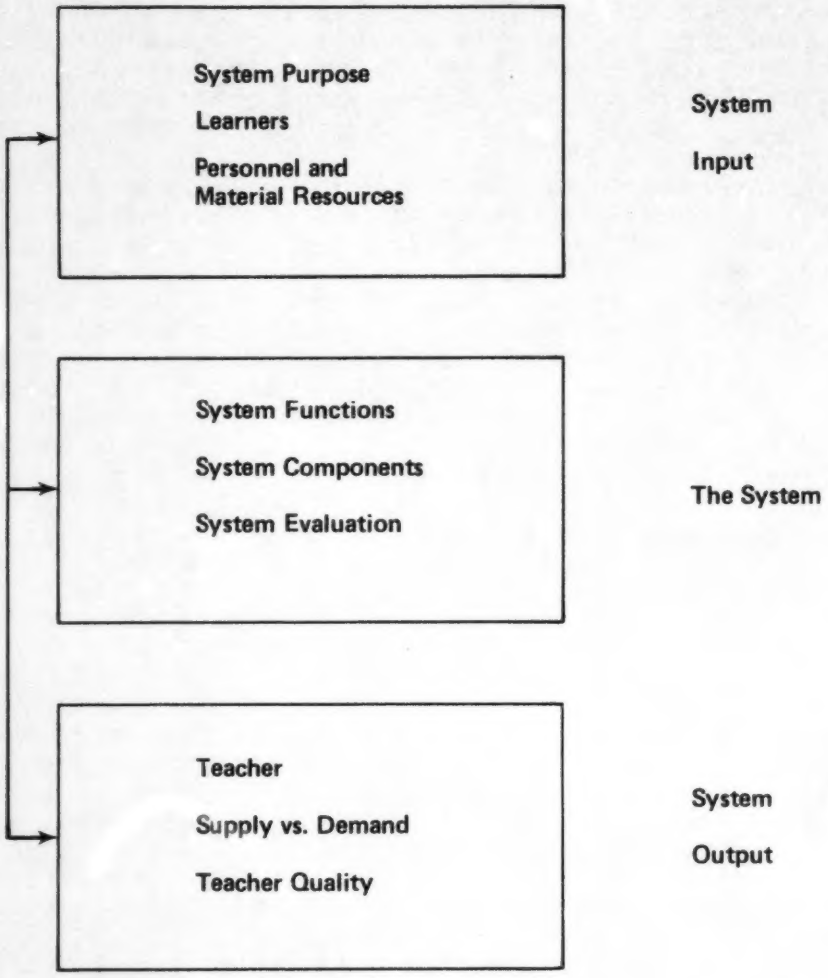
The concepts of previous authors were drawn upon in the following

ways. Moss developed a unique multi-dimensional system to use in classifying research documents.

Peterson attempted to maintain the system developed by Moss. Since he encountered some difficulty, he decided to use only the major components of the Moss system, i.e., teacher preparation programs and evaluation. The spirit of catagorization is maintained in this document. The system used to identify and review relevant research efforts is illustrated in Figure 1.

FIGURE 1

THE REVIEW MODEL



Vocational teacher education is considered a system dependent on society (a suprasystem) for its input and is responsible to it for its output. Society provides the system with input in terms of purpose, students, personnel, and material resources. For the system to maintain itself, it must effectively use input to produce satisfactory vocational teachers. System purpose, when considered along with other forms of input, greatly affects system design in that components and functions must interact in ways capable of producing a desirable product, in this case, teachers.

Since a system includes interacting functions and components and since the system itself interacts with its input and output, the research on vocational teacher education has implications that cannot be considered in isolation. In other words, since system input has implications for the system and its output, one cannot view a study from the viewpoint of input alone. This will become evident in the sections which follow.

The review is organized into four sections. As the reader will quickly see, this is a system's view of the field. In section one, system output is considered in order to determine if vocational teacher education is preparing an adequate supply of good teachers. Section two centers on system input to determine what, if any, constraints are placed on the system due to the quantity and quality of its input. The system of vocational teacher education is examined in section three. Here the manner in which the system operates is considered as are ways it might be changed to increase its success. In the concluding section, an attempt is made to state briefly what is currently known about vocational teacher education. Several recommendations also are made.

The document is a review of recent research rather than a critique of individual elements. Given the general purpose of this review, it was considered by the authors neither necessary nor practical to review critically each study. Futhermore, the review incorporates some literature that is not research. Such material is included, however, in order to establish a meaningful conceptual base from which to consider vocational research.

Finally--and of great importance--readers must understand that whether or not a particular study is cited is not an indication of its quality. Some excellent studies were excluded because they appeared to be outside the parameters of this review. Others were excluded because they appeared to be replications of earlier studies reported by Moss or Peterson.

SYSTEM OUTPUT

The success of any system is based on its ability to satisfy the purpose for which it was developed. The purpose of vocational teacher education is to produce teachers in sufficient numbers and of satisfactory quality to provide for the effective operation of local programs. To determine if vocational teacher education is successful, its output must be closely examined. Questions which should be addressed are: (1) is vocational teacher education producing enough teachers to meet current and anticipated staffing needs? and (2) are the teachers who are being prepared of satisfactory quality?

SUPPLY AND DEMAND

Moss (1967) reviewed several studies dealing with forecasting future demands for vocational teachers. In his opinion, the conflicting findings which he found were a function of the different bases used in forecasting. As a result, little confidence could be placed in the findings. A more recent attempt to use the data collected through Project Baseline to forecast future demands was judged unsuccessful. Swanson (1974) concluded that data inadequacy made it virtually impossible to determine future needs.

Although no national study could be located which successfully addressed the issue of supply and demand, several limited studies were located. Thomas and Boyett (1977) developed and used a promising formula to determine the preservice and inservice needs of vocational teachers in Florida. They found a near perfect balance between supply and demand in all fields except health and public service. In those cases the demand for teachers was greater than the known supply. Knickerbocker (1977) was able to determine future needs for home economics teachers in Louisiana plus those factors school officials considered in hiring such teachers. Based on the analysis of societal trends in health care, the efforts being made to meet health care needs, and the potential of the University of Wisconsin to prepare health care teachers, Franken (1975) recommended establishing a program for preparing health teachers to meet documented needs. Kahler (1979) was able to forcast the need for vocational teachers by occupational specialty and school in eastern Pennsylvania for each of the next five years. Using information collected from over 2,000 people involved in vocational education, he conducted the forecast by analyzing anticipated staffing changes through retirement and program emphasis.

Interpretations of future needs data must take into account the possibility that vocational education in the future could be greatly altered. According to Swanson, vocational education is currently offered in a limited number of occupations which are relatively prestigious, require long periods of training, and are institutionalized rather easily to serve people at or near the age of compulsory education. He indicated that the average age of our work force has been increasing while the average age of vocational students has been decreasing. In the future, he suggested, we should become increasingly involved with state agencies that are responsible for manpower training and development. If such were to occur, the demands on vocational teacher education could sharply increase.

Based upon the difficulty in meeting current demands for teachers of trade and industrial and off-farm agriculture occupations, there is reason to believe that problems can be anticipated in the future.

Swanson states that despite the fact that both agricultural and trade and industrial education have the longest record of federal assistance, the demand for such teachers continues to exceed the available supply. For agricultural education, the shortage is most likely related to the shift in emphasis from production to off-farm agricultural occupations.

Cross (1976) found that nearly sixty percent of all persons prepared as agricultural teachers do not enter teaching. Surveys by Reece (1976) and Knight (1977) of program graduates from Oklahoma and Ohio, respectively, found that the major reason for graduates not entering teaching was money. Money also was given as the reason for leaving teaching jobs. Respondents felt that the salaries paid agricultural teachers were not adequate for the responsibilities involved. Since agriculture teachers are employed under contracts that range from nine to twelve months a year, their annual salary varies. For instance, Milton (1977) reports that, on a national basis, salaries for such teachers ranged from $580 to $1,200 a month.

According to Goodman (1979), in 1977, 200 school administrators were unable to find agricultural teachers; in 1978, 500 schools resorted to hiring non-certified teachers.

A shortage in a field of education usually results in lowering certification standards. In vocational education, it also results in recruiting teachers directly from business and industry. This

has been the case in trade and industrial education for years. To a degree, this is currently the case in agricultural education. When people who have little or no previous formal teacher preparation are recruited as teachers, the question of quality attracts attention.

TEACHER QUALITY

A satisfactory teacher is one who has certain desirable characteristics and behaviors. Such a teacher must be able to affect students in certain desirable ways. Such a description, as vague as it is, forms a basis for research in teaching.

Educational research is an activity conducted for the purpose of increasing our power to understand, predict, or control an educational event. Using Gage's (1972) model, research that centers on determining the relationship between teachers' behavior and characteristics, on the one hand, and effects on students, on the other, is considered research on teacher effects. In contrast, research that centers on the relationship between various aspects of the preparation program and teacher characteristics and behaviors is considered research on teacher education.

In attempting to determine if the products of teacher education are of sufficient quality, research centering on teacher effectiveness as well as on teacher education must be considered. The primary focus, however, must be on teacher effectiveness.

Currently states attempt to control the quality of teachers through either certification or through program approval. Some states use both approaches. It is assumed that through these processes appropriate programs will be operating and the products will be satisfactory. This is not always the case, according to Swanson. The quality of vocational education, he indicated, is an internal matter rarely affected by external forces. Certification, he explained, is subject to the balance between supply and demand. Certification standards rise and fall as a function of imbalance.

Several recent studies illustrate how the shortage of teachers in both trade and industrial and agricultural education has influenced the lowering of certification standards. Glenn (1973) reported that only half of the states require teachers of trade and industrial subjects to possess any formal pedagogical preparation before beginning to teach. According to Glenn, only

five states require applicants to have a bachelors' degree prior to teaching. Moore (1976a) reported that the shortage of teachers in agricultural education has resulted in recruiting people from industry with less than the usual four year preparation program. In 1976, Iowa, for example, instituted emergency certification to counteract the shortage (Williams and Briers, 1978).

For the most part, these studies focused on the quality of teachers prepared in the "atypical" programs used to prepare teachers in shortage areas.

Cross surveyed a national group of agriculture educators concerning the quality of teachers prepared in abbreviated programs compared to those prepared in four year programs. The respondents felt that those prepared in the more typical programs were superior and that the quality of agriculture teachers must be maintained even at the risk of having fewer agricultural education programs.

Studies by Moore (1976a, 1976b) would seem to support the contention that a typical four year program prepares a better quality teacher. In comparing 16 teachers who completed a typical program, those who completed the typical program were judged superior. A similar study by Fields (1978) also supports the superiority of the four year program.

The Kapes and Pawlowski (1974) study of trade and industrial teachers supports the relationship between more preparation and increased teaching effectiveness. They found a significant positive relationship between the number of college credits earned by such teachers and the standardized cognitive occupational competency test scores of their students.

Based upon the few studies that center on the question of teacher quality, there is reason to believe that vocational teacher education produces a quality product. Apparently the only time this assumption is questioned is when practitioners enter teaching without having participated in a typical four year preparatory program. According to Gage, we have yet to establish adequate theories of teaching to guide teacher behavior; hence, vocational education researchers cannot justify their apparent disregard for the question of vocational teacher quality and teaching effectiveness.

Summary

Vocational teacher education is not preparing an adequate supply of vocational teachers to meet present needs, in all cases. It was noted that vocational education of the future could be greatly altered. This would have implications for the number of teachers needed and the role they might play. It is also noted that there is little evidence to suggest that vocational teacher education produces effective teachers. In short, our present system of vocational teacher education would appear to be less than totally successful.

SYSTEM INPUT

Vocational teacher education must have an adequate supply of potential applicants who are willing to enter the system as teachers. They must be persons who are able to profit from the preparation needed. To be successful, the system also must be provided with an adequate supply of personnel and material resources. Finally, and most important, the purpose of the system must be explicitly stated.

System success depends as much on system input as it does on the way the system is designed. Given inadequate input, a successful system cannot be designed. In the following section, research concerning system input will be examined.

SYSTEM PURPOSE

One of the major impediments to designing a successful teacher education system is that effective teaching has yet to be defined. Researchers continue to struggle with this problem. According to Rosenshine (1974), large scale studies have been initiated to determine the relationship between teacher competencies and student achievement.

There are three basic approaches to defining the competent teacher: theoretical, course-conversion, and task-analytical (Kay, 1975). In the first approach, the researcher starts with the theories and models of learning and teaching in order to build a description of the competent teacher. In the second, the researcher takes what currently appears in teacher education courses and translates it into competency statements and behavioral objectives. In the last case, the researcher determines what teachers are doing and what they could and should be doing, thus deriving competency statements.

Each approach has certain weaknesses. The theoretical approach is only as strong as the theory base used. Since so little is known at this time about teacher effectiveness the theory base is weak. The course-conversion approach tends to operationalize course content only. This has the effect of keeping the system of teacher education in equilibrium with no change needed. The task-analytical approach, in seeking information about teaching as it is or should be, is focused on the present. Like the course-conversion approach, this could result in maintaining the status quo.

Review of the Research

For the most part, recent research on teacher competencies has made use of the task-analytical approach. Researchers have directed much effort to identifying the competencies a successful vocational teacher must have, the level of mastery associated with being a fully competent teacher, and the criteria associated with the performance of each competency.

An ambitious competency study conducted in vocational teacher education was conducted by Cotrell and his colleagues. Cotrell et al. (1972) were able to identify 384 elements of performance associated with being a master vocational teacher or teacher of cooperative vocational education. Each performance element was divided into specific performance criteria and all the elements were organized into functional categories of teaching, e.g., instructional planning, instructional execution, and instructional management. Although this study used the task-analytical approach and, therefore, has certain weaknesses, it was a major effort to establish a base from which to launch a national effort in performance-based vocational teacher education.

One of Cotrell's recommendations was that the competencies identified be validated by vocational service and by geographic areas. This recommendation has prompted increased research activity over the past several years. Some researchers, using the Cotrell statements only, have added new competency statements, while others used the listings provided by Cotrell and others to develop new listings.

In agriculture education, teacher competency studies were conducted by Jones (1975), Matteson et al. (1974), and Trotter (1973). In trade and industrial education, such studies were conducted by Benson (1974), Gorman (1976), Perkins (1975), and Popovich (1974). In Florida, a series of competency studies by Andreyka (1976a, 1976b, 1976c, 1976d, 1976e, 1976f, 1976g, 1976h, 1976i) centered on various service areas and specialties. State studies were conducted in Nebraska by Kocher (1975) and in Oklahoma by DeVaughn (1974).

Brock (1975), Albright (1975), and Kononen (1977) conducted studies that centered on the competencies needed by vocational teachers of the handicapped student. The disadvantaged student was the focus of studies by Andreyka (1976f) and Albright (1975). Studies by Erickson (1977) and Jones (1975) focused on teacher competencies

associated with either preservice or inservice education, while Hackett et al. (1974) directed their study toward only the preservice program. McClellan (1975) focused only on the competencies needed by teachers of the adult learner.

Boronkay (1976) centered on graduate level inservice education, while both Arlton (1975) and Ely (1973) studied only teachers of secondary vocational education and their inservice needs. Blank (1976) considered only the competencies needed by community college teachers. Byle (1975) studied only the teachers of metrics in graphic arts occupations. The competencies needed by teachers of data processing was the thrust of a study by Lambrecht and McLean (1977).

From this inventory, it appears that much effort has been directed toward identifying and/or verifying the competencies needed by vocational teachers. According to Warmbrod (1974), what we need now are not more competency studies but efforts to make some sense of those available. In short, we need to know which competencies are most closely related to student achievement.

In vocational education, the subject of the teacher's occupational competence and experience has stimulated a number of studies. These studies are often directed toward the person who enters teaching with little or no formal pedagogical preparation.

A recent study by Resnick and Gardner (1977) indicates that only eleven states require vocational teachers to demonstrate occupational competence prior to functioning as a teacher. As might be expected, occupational competency testing is required only in specific occupations -- particularly those most often associated with trade and industrial education.

Most states assume that occupational competence has been developed through preparation within a conventional teacher education program and/or through occupational experience. Based on this assumption, occupational competency testing is not used. However, this assumption might be challenged. As Glenn points out, trade and industrial teachers are rarely required to hold a bachelor's degree upon entry into teaching, and four years or fewer of occupational experience is the normal requirement for such teachers upon entry into teaching. Logic suggests that certain occupations cannot be learned in four or fewer years and that the only way the occupational competence of a teacher can be assured is by using occupational competency testing procedures.

Several years ago Impellitteri (1965) concluded that there is no relationship between occupational experience and competence. This finding was supported more recently by Garner et al. (1974) and McAllister (1973). However, a more recent study by Welch and Garner (1976) suggests that there is a significant positive correlation between occupational experience and competence -- until a point is reached after which additional occupational experience does not contribute to occupational competence.

In the past few years, there have been several efforts to develop standardized occupational competency tests. These tests, according to Panitz (1975), should serve to improve the technical competence of vocational teachers, thereby improving their professional recognition. The tests are being developed by the National Occupational Competency Testing Institute (NOCTI) and are available to all states.

Recently several of the NOCTI tests were used in Georgia with 233 randomly selected vocational teachers (Tunkel and Klein, 1976). This study was designed, among other things, to establish the validity of the tests and their overall scope. It was found that the teachers who took the tests had scores on the written portion that were highly related to their scores on the performance portion. Also, test scores were highly related to years of occupational experience; scores on the written portion were highly related to scores on test items rated as essential measures of occupational competence. It was concluded that the tests were internally consistent and content valid.

In examining recent research directed toward defining the pedagogical and technical competence needed by vocational teachers, it appears that vocational teacher education has taken a significant step toward defining its purpose.

STUDENTS

A teacher education system depends on an adequate supply of people willing to become teachers. Such applicants must also be able to profit from entering into the system.

Moss examined several studies directed toward determining the potential sources of vocational teacher recruitment. He noted the methodological problems associated with attempts to predict teacher supply based on any knowledge of potential teacher sources.

Peterson's review was similar to that of Moss. The few studies which could be located, unfortunately, shed little light on the problem. According to Peterson, the continued teacher shortage results in administrators placing priorities on the potential teachers' technical "know-how" rather than teaching "know-how." He found little emphasis on recruitment by researchers; at best, research seemed to suggest that "teachers beget teachers" (p. 10).

A review of recently completed studies reveals that this pervasive problem remains but is attracting little research effort. At best, writers suggest ways to recruit more teachers (Moore, 1976a) or develop recruitment guidelines (Luft and Bender, 1974). Others discuss models for retraining existing groups of people as teachers (Kane et al., 1977), or a successful local recruiting practice (Brown and Achilles, 1974).

PERSONNEL AND MATERIAL RESOURCES

The success of vocational teacher education depends, in part, on the adequacy of the personnel and material resources available. The system must be provided with teacher educators and supporting personnel in appropriate numbers and with appropriate experience and competence. It also must be provided with facilities, equipment, and materials needed to operate successfully.

Obviously such resources cannot be obtained unless money is available. An essential aspect of vocational teacher education, therefore, is financial commitment. This is not to suggest that there is a direct positive relationship between financial commitment and success of vocational teacher education. The point is rather to emphasize that a successful system cannot be developed unless several commitments exist, financial among them.

A recent national study by Letwin (1978) focusing on the funding in different states, makes it clear that a great degree of variance exists in the patterns and amount of money made available. Letwin found that four basic funding patterns were most often used: block grants, competitive grants, cost sharing, and salary reimbursement. States frequently make simultaneous use of two or more of the patterns. She concluded that there is a national trend toward increased funding accountability and an emphasis on competitive grants.

The disparity between states as to the amount of money available for vocational teacher education was found to be great (Letwin, 1978). Out of the responding forty-three states and the District of Columbia, Letwin found that seven states made available a million or more dollars for vocational teacher education. In contrast, there were six states in which $100,000 or less was provided.

In considering a state's funding level, it is important to consider the magnitude of vocational education offerings in the state and the state's ability to support all aspects of vocational education. It is clear, however, that a state's ability to support vocational teacher education is not always related to the financial support given (Lee and Fitzgerald, 1975).

In order to insure continued support for inservice vocational teacher education in its state, the University of Minnesota found it necessary to enter into a funding agreement with the State Department of Education (Moss, 1976). A similar situation is found in Pennsylvania; the Department of Education now contracts with institutions of higher education (centers) to provide vocational teacher education services not normally offered by these institutions (Swatt, 1976). Routinely offered services at such institutions are not funded with vocational monies. They must be funded using monies from the institution's operating budgets.

Few studies were found dealing with financing vocational teacher education; few were found that focused on personnel and material resources purchased with available money.

Two studies, however, provided some information about personnel resources in vocational teacher education. One indicated that the number of vocational agriculture teacher educators available was becoming greater than needed (Moore, 1976c). The projection was that by 1980-81 there would be five such teacher educators for every available position.

In the other study, Finch et al. (1978) found that members of the National Association of Industrial and Technical Teacher Educators (NAITTE) had little personal involvement in research, neither doing it themselves nor supervising the research of others. The respondents reported that they had a multitude of research-related needs, despite the fact that most (81.4%) of them held an earned doctorate and had an average of over eleven years experience as teacher educators. It would appear that Peterson's (1973) statement about priorities holds true for members of NAITTE:

> Teacher educators are undoubtedly giving first priority to teaching responsibilities and research efforts have a secondary claim for time. It is also possible that whenever a teacher educator has the opportunity to conduct research, the broad field of vocational education bids for his attention and consequently research needs in vocational teacher education tend to go unheeded. (p. 27)

Conclusion

Because of the lack of research in the area of personnel and material resources and the use of money to procure such resources, the need for additional research is recommended. More information must be obtained about vocational teacher educators. Where do they come from? How are they prepared? How mobile are they? How effective are they in facilitating the purposes of vocational teacher education? More information must also be learned about the material resources being used by vocational teacher educators. Do they effectively use the latest technological equipment? Are they making use of effective instructional materials? Are appropriate facilities available and used to promote effective learning of students? Finally, more information must be learned about how money is being used to procure essential system resources.

THE SYSTEM

Typically, teachers are prepared on a preservice basis in four-year programs. Upon graduation, they hold a bachelor's degree and initial certification. The usual teacher education program consists of a balance of courses in general and professional education and courses in a specific content specialty. By choice or by regulation, such graduates often engage in additional courses or alternative learning experiences to improve their professional competence. They become involved in inservice programs.

The pattern followed by all teachers is followed by vocational teachers too, except when there is a critical shortage for certain kinds of vocational teachers. When this occurs, certification standards are lowered; the use of inservice teacher education is emphasized. For instance, the teachers of trade and industrial subjects frequently begin teaching with little or no previous formal pedagogical preparation; they must receive such preparation through inservice experiences. This pattern is now more typical in preparing teachers of agricultural occupations since severe shortages have developed.

Since vocational teacher education is not producing an adequate number of teachers to fill present needs and since, to date, little evidence exists to support a claim that the system produces effective teachers, changes in the system appear to be needed. But the question is *what changes* should be made and who should function as the change agent? This issue was faced by both Moss and Peterson. Moss pointed out that we do not know the most efficient way to prepare highly qualified teachers. However, he hastened to add, this does not mean that what we now do is bad but only that we are not in any position to judge its worth. Research to date, he noted, has not systematically addressed the question. Peterson also noted that, with the exception of some studies on micro-teaching, video-feedback, and teacher competency, research on vocational teacher education remains unfocused and sparse.

For the most part, recent research on vocational teacher education also appears to be sparse and unfocused. However, viewed within a framework of systems theory, some studies have clear focus and great significance.

According to Banathy (1968), an educational system fulfills its purpose through specific functions performed by certain interacting system components. An education system is maintained through each of the following four functions: the selection and organization of system content, the selection and organization of learning experiences, the management of the learners, and the evaluation of learning and the operating system.

An effective system is one which makes a cost-effective use of components to carry out system functions. The components are the learner, teacher, support personnel, and service personnel. Software and hardware of various descriptions are also available to the system.

In selecting system components to fulfill system functions, the components must have the ability to integrate with other components, have relevance to the learners, have practicality, and serve system economy. Component selection is based on understanding the limitations and constraints found within the system's operating environment.

SYSTEM FUNCTIONS

In conventional vocational teacher education systems, teacher educators are the primary system components because they usually perform all system functions. Even when teacher educators allow students to participate in the selection and organization of course content and learning experiences, they maintain primacy in the system.

The studies reviewed by both Moss and Peterson serve to illustrate the position of the teacher educator in the conventional system. Research centers on the search for appropriate system content and better ways of organizing that content. Some studies center on the organization of alternative learning experiences for students; some focus on media and alternative ways of using it to improve learning experiences. Few studies center on better ways of organizing or administering teacher education programs. In all of these studies there is an assumption that someone, most often the teacher educator, is central to the system.

Moss found major gaps in the area of "program development." He noted that additional studies were needed in the areas of content selection and organization as well as in program organization and administration. He called for research efforts to determine which teacher education functions might best be performed by local schools, private industry, or state departments of education.

A Brief Review Of the Literature

There is much literature to be found on the concept of performance-based teacher education (PBTE). PBTE (or CBTE, competency-based teacher education) is a concept that is not supported by all teacher educators (Gilli, 1974). In any case, the idea has provided stimulus for a significant amount of research in vocational teacher education.

Vocational teacher education became involved in PBTE in the late 1960s when Cotrell directed a project at The Center for Vocational Education (now the National Center for Research in Vocational Education) to identify the competencies needed by vocational teachers. Cotrell and his colleagues (1972) helped to define the purpose for vocational teacher education but, more importantly, established the base from which the Center developed a PBTE system for preparing vocational teachers. The fact that the relationship between system functions and components is redefined is of great significance.

The new system is based on 100 modules developed around 384 elements of a master vocational teacher's performance. Each module includes content appropriate to the performance elements and sequenced learning experiences in order to help learners develop the needed skills. The criteria by which performance can be assessed, standards for appropriate performance, and instruments to use when assessing performance also are included.

Supporting materials which instruct the learners in how to use the modules are available (Norton and Huang, 1971; Hamilton and Quinn, 1978). Also included are a guide for implementing a PBTE program (Fardig et al., 1977) and a state-of-the-art publication (Norton et al., 1978). The modules were developed at a cost of over $18,000 each; they and the supporting materials are available through the AAVIM, the American Association for Vocational Instructional Materials (Hamilton et al., 1977a, 1977b).

The materials were carefully tested at each stage in their development and have been judged effective. According to Hamilton, feedback has been obtained from over 2,000 preservice and inservice teachers as well as 300 resource persons (teacher educators) in over 20 colleges and universities. The materials were judged effective in helping learners develop specific teaching competencies. It has been recommended that they be used to prepare vocational teachers at both the preservice and inservice levels. (Hamilton et al., 1977a, 1977b).

According to Norton et al. (1978) not everyone accepts the PBTE concept. This situation has slowed down its diffusion and adoption. However, based upon a 1978 sales report from AAVIM, the materials are now being widely disseminated. Currently they are finding their way into colleges and universities here and overseas. State departments of education are purchasing them as well as secondary schools.

The PBTE materials have become available at a critical time. According to Andreyka and Blank (1976), over 30 states have either shown support of the concept or are seriously considering such action. At present there are at least 20 national centers, consortia, institutes, and other groups which have the promotion of the PBTE concept as one of their major purposes.

As stated above, these PBTE materials, if used in the manner suggested, will redefine the role of the teacher educator. The materials themselves take on most of the functions normally assumed by teacher educators. The materials include system content and learning experiences organized to promote learning. The modules provide for learner feedback and self-evaluation. They also suggest how the student should use the materials and how the student's resource person might operate to assist in the learning process. In addition, the materials suggest how the program might be operated and managed. As indicated, materials assume most of the functions normally assigned to the teacher educator. As such, they and the learners who use them become the primary components in a PBTE system.

According to Norton et al., (1978), there have been a number of vocational teacher preparation institutions that have developed programs that make use of the PBTE materials. Such programs now operate at the University of Maine (Portland-Gorham), Florida State University, Holland College (in Canada), and Temple

University. In addition, there are numerous institutions that make limited use of these PBTE materials and others which use other PBTE materials.

One vocational program that makes use of the new PBTE materials is Program VITAL, operational since 1973 (Adamsky and Cotrell, 1975; Bradley, 1978). The program is unique in that each test edition of the modules was used in the program, thus allowing for feedback to those developing the materials.

Program VITAL was developed using system theory and, as a result, an essential characteristic of it is its research base. Each year the program is routinely evaluated for the purpose of making appropriate changes in the way each sub-component of the system operates (Adamsky, 1977). The changes made in the program are carefully recorded and evaluated at the end of each operating year (Adamsky, 1974; Adamsky, 1978a; Bronk and Adamsky, 1977; Kapel and Adamsky, 1975; Wichowski and Adamsky, 1976). The program makes use of a sub-system to manage information so that decisions can be made more rationally (Adamsky, 1978b). The relationship between system functions and system components, as such exists in Program VITAL is described by Bradley (1974b, 1975, 1977).

A program similar to VITAL was recently pilot tested by the University of Florida (Blank, 1977). Seventeen non-certificated vocational teachers were served in this field-centered program by 15 resource persons and six vocational teacher educators. The teachers were rated on 57 teaching skills addressed in the modules. Ratings were provided by the students and their teacher educators. It was concluded that this field-centered effort was effective and is a viable alternative to the conventional method used to prepare teachers. The only major problem cited was in the area of evaluating teacher competency.

Another pilot test involving PBTE was conducted in Colorado (Richardson, 1976). The focus was on the use of video-taped lessons and accompanying modules (not those developed at the National Center) intended to serve teachers using a field-centered approach. Based on learners' response to a 21-item instrument, it was concluded that learners preferred the new delivery system over the conventional one.

Indiana University of Pennsylvania (Walker, 1978) and The Pennsylvania State University (Detwiler and Shemick, 1979) are both pilot testing a program modeled after Program VITAL. If successful, these approaches to PBTE will be in operation in the Eastern, Central, and Western regions of the state.

Vogler (1975) describes the development of a baccalaureate degree program for the preparation of vocational teachers at the University of Michigan. This performance-based, capstone program began in 1971 and serves teachers from all service areas of vocational education. The PBTE program was developed around the Cotrell et al. competencies (1972). One of Vogler's recommendations was that individualized self-instructional materials be developed in support of the program.

Edmunds (1978) recently has developed a PBTE program for the professional preparation of two-year postsecondary vocational education teachers in Nebraska. The program makes use of the new PBTE materials and requires those persons seeking vocational approval (certification) to develop both specific and supplemental competencies. Nebraska apparently based much of its selection of competencies on an earlier competency study by Kocher (1975).

SYSTEM COMPONENTS

The conventional preservice and inservice vocational teacher education program operates with the teacher educator as the primary system component. The program is designed around courses offered during the day or evening at a university or off-campus center. Each course is taught by a full-time faculty member or a local vocational educator on the adjunct staff.

In the conventional program, individual instructors perform all or most system functions and operate within rather unrestrictive program parameters. Courses are time-based and are usually conducted according to the university calendar.

The courses in such conventional programs, aside from those in general education, are designed to develop skills in pedagogy and the occupational specialty to be taught, often simultaneously, e.g., principles of teaching electronic data processing and methods of teaching agronomy.

The teacher educator's role in a conventional program is to assume system functions and to operate as the main source of system content. For this reason, it is the teacher educator who plans each course and, through such techniques as lecture and discussion, dispenses much of the system content.

Over the years, much research has dealt with alternative techniques for dispensing system content and the ways to organize this content. Recent studies appear to be directed more to determining needed competencies. In effect, they ask the deeper question, namely, what content should be included in a program?

If PBTE materials are adopted by teacher educators and used as suggested, the teacher educator's role will be greatly altered. The functions they normally perform will be assigned to the materials and the students using them. They will change from being the component around which teacher education is developed to being one part of the support system component.

The new role of a vocational teacher educator is defined by Hamilton and Quinn (1978). In their view, resource persons operate as student advisors, helpers, and evaluators, not as lecturers or discussion leaders. Resource persons are responsible for providing the interpersonal dimension, the humanizing dimension, to the program.

A basic requirement for using the new PBTE materials properly is that learner performance be assessed in an actual teaching environment. Although the materials allow for skill practice in a simulated setting, the final learning experience requires competence to be demonstrated in a classroom or laboratory.

Some educators question the practicality of assigning the new PBTE materials such a central role in vocational teacher education. Some feel that they are not easily integrated into such programs; others consider the costs prohibitive. Undoubtedly some feel that the materials will lead to the dehumanization of vocational teacher education and the displacement of teacher educators. These are valid concerns and research on each issue is needed. Two points are certain: the new materials are being widely distributed and they seem capable of fulfilling most of the functions normally assumed by the teacher educator.

SYSTEM EVALUATION

There is reason to believe that vocational teacher education is not completely successful in meeting its purpose. This could be due to our having insufficient input into the system or to flaws within the system itself. In any case, the reasons must be identified and steps taken to overcome the problem.

Research differs from evaluation in that in the former one attempts to draw generalizable conclusions from data; in the latter one attempts to use data for decision making (Popham, 1975). As a field of inquiry, evaluation is still very much in its formative stages. Currently there are numerous evaluation models, each with particular strengths and weaknesses.

In viewing teacher education as a system, one must consider the product (product evaluation) and the process by which the product is fashioned (process evaluation). All decisions about the product must be taken into account: the adequacy of system input, the relative effectiveness of system components in fulfilling system functions, and the environment in which the system must operate.

A number of studies previously cited were conducted for evaluative purposes, e.g., the study by Hamilton et al. (1977a, 1977b) assessing the effectiveness of newly developed PBTE materials and the study by Richardson (1976) comparing the effectiveness of two teacher education delivery systems. Two studies were conducted for the purpose of evaluating the success of Program VITAL, an alternative to a conventional program to prepare trade and industrial teachers. Colistra (1975) compared the teaching behavior of teachers prepared in PBTE (Project VITAL) to those prepared in a conventional program. He found no significant differences between the two groups. Foell (1977) compared the cognitive occupational competence of students of teachers prepared in Program VITAL to students of teachers prepared in the conventional manner. Again, no differences between groups were found.

The lack of differences between groups in these studies suggests that, other things being equal, there is no research foundation for selecting one program over the other. However, based on the findings of Adamsky (1974) and Kapel and Adamsky (1975), students preferred Program VITAL over the conventional program. They indicated that there was evidence to show that teachers met program requirements more quickly in the PBTE program.

Handley (1973a, 1973b) assessed the effectiveness of both the preservice and inservice vocational teacher education programs in Mississippi. In both assessment studies the questionnaire technique was used to ask graduates to indicate the effectiveness of the programs to develop specific teaching skills. In the preservice assessment respondents claimed that the program would be improved if students received more experience in actual school

situations, in team teaching, in the use of standardized testing, and in the use of media. In the inservice assessment, respondents preferred inservice education that generated university credit. They also noted that they felt quite competent in the teaching skills addressed in the questionnaire.

Hillison and Bird (1974), in using a "product-process" evaluation scheme, evaluated vocational teacher education in Kentucky. The pilot effort centered on seven teachers from each vocational service area. Through observing teaching behavior and using data collected from students, peers, and supervisors, they found that recent graduates were directive in their teaching style. Furthermore, the teachers' peers and supervisors could not discriminate between "good" and "bad" teachers, a skill that the teachers' students had.

A sophisticated, yet untested, evaluation model was developed by White et al. (1976) in order to be generalized to all programs in Indiana. Like the Hillison (1974) model, it centered on both "process" and "product" evaluation.

Kievit (1975) used a subjective, but convincing, approach to determining what effect research and developmental activity was having on vocational teachers' operating practices. After reviewing the research and developmental activities recently completed and the various techniques for disseminating the results, she concluded that these efforts had had little effect on teaching practices. Her significant conclusions were: (1) that teacher education was not effective in diffusing new knowledge and (2) that teacher educators had only a limited influence on whether or not local teachers adopted new teaching practices.

Summary

How should a vocational teacher education system be designed? How should system components interact to achieve system functions? Are changes needed to improve vocational teacher education? If so, what kinds of changes are needed? Should the changes be directed toward making the system performance-based or is there sufficient evidence to suggest a different direction? These are some of the questions researchers must address if vocational teacher education is to operate on a basis other than conventional wisdom.

CONCLUSION

This review has attempted to determine whether or not teacher education has escaped its ancillary status and, through research, moved toward becoming an intellectual field.

Evidence suggests that vocational teacher education remains an ancillary activity. Financial support varies markedly among the states; few states base their financial support on an ability to provide for the preparation of vocational teachers. As states move toward the competitive grant funding pattern, the support now provided could be further eroded.

Although there have been several significant research efforts recently, with each having the potential for improving vocational teacher education, research in this field remains sparse overall. Researchers, it would appear, have basically ignored the earlier suggestions of Moss and Peterson. Perhaps sufficient incentives for such research have not been provided. Whatever the reason, one fact is clear, namely, there has not been much progress recently toward establishing vocational teacher education as an intellectual field within the broader area of educational research.

RECOMMENDATIONS

The recommendations for research are as follows:

System Output

- Determine the relationship between both occupational and pedagogical competence and student achievement.
- Establish minimum standards for occupational and pedagogical competence.
- Develop standardized occupational competency tests for all vocational education teaching specialties.
- Establish minimum standards for occupational experience based on the varied quality of such experience.
- Determine if either the program approval or certification processes have any effect on system output.

- Develop and test various models potentially capable of predicting the future needs for vocational teachers.

- Determine the past and present holding pattern in vocational teacher education and in vocational education in general. (For example, how many students enter the program and remain? How many enter teaching and remain?)

System Input

- Develop and test various models potentially capable of recruiting an appropriate number of vocational teachers.

- Determine the characteristics of vocational teacher educators. (For example, how did they become teacher educators? How were they prepared for such a role? What functions do they currently perform?)

- Determine what part of the operating budget for vocational teacher education is provided by universities and what part is provided from other sources.

- Determine what percent of state vocational monies are allocated to teacher education and what percent is allocated through project funding compared to program funding.

The System

- Adopt and test the effectiveness of the PBTE materials being developed.

- Determine the cost and benefits of operating PBTE programs compared to operating conventional programs.

- Determine the extent to which the new PBTE materials are being used in the prescribed manner.

- Determine the effect of using the new PBTE materials in inappropriate ways.

REFERENCES

Adamsky, R. A. "Increasing Learner Progress in a Self Paced Teaching Education Program Without the Use of Sanctions." *Journal of Industrial Teacher Education.* 15 (Fall, 1977): 26-31.

_____. *Installation of Competency-Based Learning Packages and Systems in Vocational Education: An Assessment.* Unpublished Report. Philadelphia: Temple University, 1974.

_____. *Installation of Competency-Based Learning Packages and Systems in Vocational Education: An Assessment.* Unpublished Report. Philadelphia: Temple University, 1978a.

_____. "Vital-Mis: Managing Information in a PBTE Program." *Journal of Industrial Teacher Education.* 16 (Fall, 1978b):

_____ and Cotrell, C. J. "Program VITAL: A Futuristic Inservice Model for Vocational Teacher Education." *Journal of Industrial Teacher Education.* 12 (Summer, 1975): 39-46.

Albright, L. *Identification of Professional Competencies Necessary for Teachers of Disadvantaged and Handicapped Youth.* Kent, Ohio: Kent State University, 1975. (ED 126 309)

American Association of Colleges for Teacher Education. *Achieving the Potential of Performance-Based Teacher Education: Recommendations.* PBTE Monograph Series: No. 16. Washington, D. C.: American Association of Colleges for Teacher Education, 1974.

American Association for Vocational Instructional Materials. "Sales Report-August, 1978." Athens, Ga.: American Association for Vocational Instructional Materials, 1978.

Andreyka, R. E. *Exemplary Competency-Based Vocational Teacher Education Project: Administration/Supervision Component.* Tallahassee: Florida State University, 1976a. (ED 131 249)

_____. *Exemplary Competency-Based Vocational Teacher Education Project: Industrial Arts Component.* Tallahassee: Florida State University, 1976b. (ED 131 229)

_____. *Exemplary Competency-Based Vocational Teacher Education Project: Business Education Component.* Tallahassee: Florida State University, 1976c. (ED 131 272)

_____. *Exemplary Competency-Based Vocational Teacher Education Project: Career Education Component.* Tallahassee: Florida State University, 1976d. (ED 131 230)

_____. *Exemplary Competency-Based Vocational Teacher Education Project: Cooperative Vocational Education Component.* Tallahassee: Florida State University, 1976e. (ED 131 248)

_____. *Exemplary Competency-Based Vocational Teacher Education Project: Disadvantaged Component.* Tallahassee: Florida State University, 1976f. (ED 131 251)

_____. *Exemplary Competency-Based Vocational Teacher Education Project: Handicapped Component.* Tallahassee: Florida State University, 1976g. (ED 131 232)

_____. *Exemplary Competency-Based Vocational Teacher Education Project: Research/Evaluation Component.* Tallahassee: Florida State University, 1976h. (ED 131 250)

_____. *Exemplary Competency-Based Vocational Teacher Education Project: Trade and Industrial Education Component.* Tallahassee: Florida State University, 1976i. (ED 131 229)

_____, and Blank, W. E. "A Checklist for the Evaluation of Competency-Based Teacher Education Programs." *Educational Technology.* 16 (January, 1976): 34-36.

Arlton, D. M. *Competencies for Secondary Health Occupations Teachers.* Washington, D. C.: ERIC Clearinghouse on Teacher Education, 1975. (ED 114 392)

Banathy, B. H. *Instructional Systems.* Belmont, California: Fearon Publishers, 1968.

Benson, M. J. et al. *The Industrial Education Teacher's Professional Tasks.* Menomonie: University of Wisconsin at Stout, 1974.

Blank, W. E. *Analysis of Professional Competencies Important to Florida's Community College Technical Instructors: Implications for Competency-Based Teacher Education.* Ph.D. Dissertation, Tallahassee: Florida State University, 1976.

_____. *Competency Based Industrial Teacher Education Project Phase III. Inservice Program.* Tallahassee: Florida State Department of Education, 1977. (ED 145 222)

Boronkay, J. R. *Graduate Level Professional Education Competencies for Occupational Teacher Education.* Ed.D Dissertation, Buffalo: State University of New York, 1976.

Bradley, C. H. "Competence Motivation Reconsidered: The Construct of Intentionality." *Journal of Industrial Teacher Education.* 12. (Spring, 1975): 66-74.

_____. "Program VITAL: Characteristics, Concepts, and Deprived Learnings." *Journal of Industrial Teacher Education.* 16. (Fall, 1978): 57-67.

_____. "The Helping Conference in Microsupervision." *Journal of Industrial Teacher Education.* 11. (Fall, 1974): 5-10.

_____. "Two Filters for the Intentional Teacher." *Technology Today.* 2 (1977): 20-24.

Brock, R. J. *Vocational Education for the Handicapped: A Competency Based Program.* Menomonie: Wisconsin University-Stout, 1975. (ED 142 005)

Bronk, C. and Adamsky, R. A. *Installation of Competency-Based Learning Packages and Systems in Vocational Education: An Assessment.* Unpublished Report. Philadelphia: Temple University, 1977.

Brown, D. V. and Achilles, C. M. "How to Teach Teachers and Technicians Under One Roof." *American Vocational Journal.* 49. (October, 1974): 50-52.

Byle, A. D. *An Anlysis Model to Determine Metric Measurement Competencies for Preservice and Inservice Education as Applied to the Graphic Arts Industry.* Ph.D. Dissertation, East Lansing: Michigan State University, 1975.

Colistra, A. *A Comparison of Factors of Teacher Effectivnesss for Interns Participating in a Performance-Based Teacher Education Program.* Ed.D. Dissertation, Philadelphia: Temple University, 1975.

Cotrell, C. et al. *Model Curricula for Vocational and Technical Teacher Education: Report No V-General Objectives, Set II.* Columbus: The Center for Vocational Education, The Ohio State University, 1972.

Cross, J. "AG Educators Debate Teacher Shortage." *American Vocational Journal.* 51 (February, 1976): 35-36.

Detwiler, L., Sr. and Shemick, M. *A Verification of Industrial Education Teacher Competencies by In-Service Vocational Industrial Education Teachers and Industrial Arts Teachers from the Central Region of Pennsylvania.* University Park: The Pennsylvania State University, 1979.

DeVaughn, Z. F., Jr. *Competencies Needed by Vocational and Technical Education Teachers as Rated by Selected Groups.* Ed.D. Dissertation, Stillwater: Oklahoma State University, 1974.

Edmunds, N., ed. *Professional Preparation for Two-Year Postsecondary Vocational Teachers: Handbook.* Lincoln: The Nebraska Advisory Council for Vocational Education, 1978.

Ely, R. H. *Performance-Based Professional Education Inservice Needs of Secondary Level Occupational Teachers in New York State.* Ph.D. Dissertation, Ithaca: Cornell University, 1973.

Erickson, P. M. *The Effect of Position and Vocational Service Area on the Essentialness of Competencies for Teacher Education.* Ph.D. Dissertation, West Lafayette: Purdue University, 1977.

Fardig, G. E. et al. *Guide to the Implementation of Performance-Based Teacher Education.* Athens, Ga.: American Association for Vocational Instructional Materials, 1977.

Fields, M. A. "Non-Agricultural Education Majors' Teaching Effectiveness." *Agricultural Education.* 50 (January, 1978): 165-166.

Finch, C. et al. "Research Needs of NAITTE Members." *Journal of Industrial Teacher Education.* 15 (Winter, 1978): 7-16.

Foell, N. A. *Relationships of Competency-Based Teacher Education and Conventional Teacher Education Delivery Systems to the Cognitive Achievement of Secondary Level Vocational Education Students.* Ed.D. Dissertation, Philadelphia: Temple University, 1977.

Franken, E. *Health Occupations Teacher Education Planning: Summary of Findings, Conclusions and Recommendations.* Madison: Wisconsin University, 1975. (ED 141 599)

Gage, N. L. *Teacher Effectiveness and Teacher Education: The Search for a Scientific Basis.* Palo Alto: Pacific Books, Publishers, 1972.

Garner, W. et al. *Vocational-Industrial Teacher Education at the Pennsylvania State University: An Examination of Program and Student Characteristics.* University Park: The Pennsylvania State University, 1974. (ED 112 144)

Gilli, A. C., Sr. "Competency-Based Teacher Education: A Plea for Caution." *American Vocational Journal.* 49 (April, 1974): 30-31.

Glenn, J. W., Jr. *A New Concept in Vocational-Technical Education: The Associate Degree.* Paper presented at American Vocational Association Convention (Atlanta, Georgia, December, 1973).

Goodman, P. W. ed. "Division Reports." *Update.* Washington, D.C.: American Vocational Association. 1 (January, 1979).

Gorman, C. V. *An Analysis of the Perceived Professional Competencies Presented During Ohio's Trade and Industrial Inservice Teacher Education Program.* Ed.D. Dissertation, University Park: The Pennsylvania State University, 1976.

Hackett, B. et al. "Pre-Service Occupational Program Instructional Competencies." *Illinois Career Education Journal.* 31 (Spring, 1974): 21-25.

Hamilton, J. et al. *Performance-Based Professional Education Curricula. Final Report Vol. 1: Curriculum Development.* Columbus: The Center for Vocational Education, The Ohio State University, 1977.

_____, and Quinn, K. M. *Resource Person Guide to Using Performance-Based Teacher Education Materials.* Athens, Ga.: American Association for Vocational Instructional Materials, 1977.

Handley, H. M. and Shill, J. F. *Assessment of Preservice Vocational Teacher Education in Mississippi.* Jackson: Mississippi State College, 1973. (ED 069 452)

_____, and Shill, J. F. *Assessment of Inservice Vocational Teacher Education in Mississippi.* Jackson: Mississippi State College, 1973. (ED 090 364)

Hillison, J. *The Development and Try-out of a System of Evaluating Programs of Vocational Teacher Education.* Paper presented at the annual meeting of the American Education Research Association. (Chicago, Illinois, April, 1974) (ED 092 586)

_____, and Bird, S. E. "The Development and Tryout of a System for Evaluating Programs in Vocational Teacher Education. *Journal of the American Association of Teacher Educators of Agriculture.* 15 (November, 1974): 12-16.

Impellitteri, J. T. *An Analysis of the Occupational Competency Evaluation Program at The Pennsylvania State University from 1944 to 1956.* University Park: The Pennsylvania State University, 1965.

Jones, J. D. *Vocational Agriculture Teacher Perceptions of Competencies as Bases for Pre and Inservice Agricultural Education Programs in Oklahoma.* Ed.D. Dissertation, Stillwater: Oklahoma State University, 1975.

Kahler, E. *An Assessment of the Professional Needs of Vocational Educators in the Eastern Region of Pennsylvania.* Ed.D. Dissertation, Philadelphia: Temple University, 1979.

Kane, R. D. et al. *A Model to Retrain Women Teachers and Skilled Women as Teachers in Non-traditional Vocational Programs.* Arlington, Virginia: Rj Associates, Inc., 1977. (ED 143 878)

Kapel, D. and Adamsky, R. A. *Installation of Competency-Based Learning Packages and Systems in Vocational Education: An Assessment.* Unpublished Report. Philadelphia: Temple University, 1975.

Kapes, J. T. and Pawlowski, V. *Characteristics of Vocational Technical Instructors and Their Relationship to Student Shop Achievement.* University Park: The Pennsylvania State University, 1974.

Kay, P. M. *What Competencies Should be Included in a C/PBTE Program?* Washington, D.C.: American Association of Colleges for Teacher Education, 1975.

Kievit, M. B. *Vocational Education Research and Development as a Factor Influencing Teachers to Change Practices.* Washington, D.C.: Assembly of Behavioral and Social Sciences, 1975.

Knickerbocker, A. H. *Opportunities and Directions of the Vocational Home Economics Programs as Perceived by Louisiana School Superintendents and Supervisors: Final Report.* Ruston: Louisiana Technical University, 1977. (ED 147 551)

Knight, J. A. *Why Vocational Agriculture Teachers Leave Teaching.* Ph.D. Dissertation, Columbus: The Ohio State University, 1977.

Kocker, E. *A Competency Based Program for Preparing Vocational Education Teachers Final Report.* Nebraska: Kearney State College, 1975. (ED 118 919)

Kononen, J. W. *A Study of Unique Teacher Education Competencies Needed by Vocational Education Teachers to Work with Secondary Handicapped Students.* Ed.D. Dissertation, Corvallis: Oregon State University, 1977.

Lambrecht, J. J. and McLean, G. N. *Content and Methodology Background and Perceived Competencies of Data Processing Teachers in Minnesota and Wisconsin Final Report.* Minneapolis: University of Minnesota, 1977. (ED 145 802)

Lee, A. M. and Fitzgerald, D. *Learning a Living Across The Nation - Volume IV.* Flagstaff: Northern Arizona University, 1975.

Letwin, L. S. *Vocational Teacher Education Funding Patterns Used by State Department of Education.* Ph.D. Dissertation, East Lansing: Michigan State University, 1978.

Luft, V. D. and Bender, R. E. *The Development of Guidelines for Recuitment Programs in Agriculture Education.* Columbus: The Ohio State University, 1974. (ED 109 424)

Matteson, R. et al. *Function-Task-Competency Approach to Curriculum Development in Vocational Education in Agriculture: Research Report No. 2. Professional Competencies Possessed and Needed by Vocational Instructors in Agriculture and When They Should be Developed.* Madison: Wisconsin University, 1974. (ED 110 719)

McAlister, P. *A Study of Occupational Experience of Individuals Who have Successfully Participated in the Occupational Competency Program Administered by the Department of Vocational Education at the Pennsylvania State University.* Ph.D. Dissertation, University Park: The Pennsylvania State University, 1973.

McClellan, V. B. *A Study of the Competencies Unique to the Educators of Adults in the Vocational, Technical and Adult Education System. Final Report.* Menomonie: Wisconsin University-Stout, 1975. (ED 131 304)

Milton, C. D. *Salaries and Working Conditions of Agriculture Teacher in the United States.* M.S. Thesis, Stillwater: Oklahoma State University, 1977.

Moore, G. E. *Teaching Effectiveness of Two Groups of Beginning Teachers of Vocational Agriculture: Summary of Research Series.* Columbus: The Ohio State University, 1976a. (ED 131 188)

_____, "Teaching Effectiveness of Entry-Level Teachers of Vocational Agriculture from College Versus Industry." *Journal of Vocational Education Research.* 1 (Winter, 1976b): 45-58.

_____. *The Projected Supply and Demand of Teacher Educators of Agriculture 1977-1981.* West Lafayette: Purdue University and Huntsville: Alabama A & M University, 1976.

Moss, J., Jr. *Review of Research in Vocational-Technical Teacher Education.* Minneapolis: University of Minnesota, 1967. (ED 016 803)

_____. "Financing and Managing In-Service Teacher Education at the University of Minnesota." *Journal of Industrial Teacher Education.* 11 (Fall, 1976): 5-10.

Norton, R. E. and Huang, M. W. *Student Guide to Using Performance-Based Teacher Education Materials.* Athens, Ga.: American Association for Vocational Instructional Materials, 1977.

Panitz, A. "National Occupational Competency Exams for Future Teachers." *American Vocational Journal.* 50 (February, 1975): 72-74, 76-77.

Perkins, L. H. *Competencies of Trade and Industrial Teachers: As Perceived by Teachers, Supervisors, School Administrators, and Teacher Educators.* Tallahassee: Florida State Department of Education, 1975. (ED 112 067)

Peterson, R. L. *Review and Synthesis of Research in Vocational Teacher Education.* Information Series Number 101. Columbus: The Center for Vocational and Technical Education. The Ohio State University, 1973. (ED 087 898)

Popham, W. J. *Education Evaluation.* Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1975.

Popovich, N. J. *A Validation of Selected Teaching Competencies for Industrial Teacher Education.* Paper presented to The American Educational Research Association, Chicago, 1975. (ED 091 539)

Reece, D. H. *Factors Influencing Vocational Agriculture Teachers to Leave the Vocational Agriculture Teaching Profession in Oklahoma between the years 1970-1976.* M.S. Thesis, Stillwater: Oklahoma State University, 1976.

Resnick, H. S. and Gardner, D. C. *An Analysis of National Certification Requirements and Professional Development Standards for Vocational Education Personnel.* Boston: Boston University, 1977. (ED 146 410)

Richardson, D. L. et al. *Effectiveness of an Alternative Delivery System for Inservice Vocational Teacher Education.* Greeley: University of Northern Colorado, 1976. (ED 123 432)

Rosenshine, B. "Teacher Competency Research." *P3TE.* 3 (December, 1974).

Swanson, G. I. *The Preparation of Teachers for Vocational Education: Project Baseline Supplemental Report.* Flagstaff: Northern Arizona University, 1974. (ED 099 690)

Swatt, K., ed. *A Position Paper on the Funding of Vocational Education Professional Development Programs in Pennsylvania.* Unpublished Report. Harrisburg: Pennsylvania Department of Education, 1976.

Thomas, H. B. and Boyett, R. H. *Baseline Data for Teacher Education: Final Report.* Tallahassee: Florida State University, 1977. (ED 134 686)

Trotter, E. E. *A Study of Selected Competencies Performed by Agriculture Occupations Student-Teachers During a Summer Experience Program.* Ed.D. Dissertation, Urbana: University of Illinois, 1973.

Tunkel, L. S. and Klein, R. S. *Vocational Competency Testing Project (July 1, 1975 - October 31, 1976): Final Report.* Atlanta: Georgia State Department of Education, 1976. (ED 141 526)

Vogler, D. E. *Capstone, Comprehensive Occupational Teacher Education Project.* Ann Arbor: University of Michigan, 1975. (ED 122 066)

Walker, T. J. *Vocational Personnel Program.* Mimeographed. Indiana, Pennsylvania: Indiana University of Pennsylvania, 1978.

Warmbrod, R. *Some Goals for Research in Teacher Education.* Paper presented at the 28th Annual Meeting, Agricultural Education Research Report. (Central Region, Michigan State University), 1974.

Welch, E. G. and Garner, W. C. "Occupational Experience: How Much is Enough?" *American Vocational Journal.* 51 (September, 1976): 34-35.

White, T. R., et al. *Development of Generalizable Model for Evaluation of Vocational Teacher Education.* Bloomington: Indiana University, 1976. (ED 131 262)

Wichowski, C. and Adamsky, R. A. *Installation of Competency-Based Learning Packages and Systems in Vocational Education: An Assessment.* Unpublished Report. Philadelphia: Temple University, 1976.

Williams, D. L. and Briers, G. "Emergency Certification Program." *Agricultural Education.* 50 (January, 1978): 158-159.